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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/048,023

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Yasukazu Iwasaki

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EXAMINER

WACHTEL, ALEXIS A

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/048,023

Applicant(s)

IWASAKI, YASUKAZU

Examiner

Alexis Wachtel

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1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4-11-06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,4,7,12,13 is/are allowed.
- 6) ☒ Claim(s) 1,2,5,9-11 and 68 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Response to Amendment

1. Applicant's amendment and accompanying Remarks filed 4-11-06 have been entered and carefully considered.

The amendment is sufficient to overcome the obviousness rejections of claims 1,2,5,6,8-11. However, an updated search yielded new prior art that provides a new basis of rejection as shown below. Applicant's arguments are rendered moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,2,5,6,8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0973219 to Masaaki et al and US 20010046462 to Woods et al.

With respect claim 1, EP 0973219 to Masaaki et al teach a fuel reforming system comprising a fuel reformer (4) for generating a reformed gas containing hydrogen a mixer of vapors (7) of the gas fuel or the liquid fuel. and the gas containing the oxygen, a supplier (line from (7) to reformer (4) of vapors of the gas fuel or the liquid fuel into said fuel reformer through the mixer, and a controller (36) of first flow rate of the vapors of the gas fuel or the liquid fuel supplied into said fuel reformer.

Masaki et al does not teach a supplier of oxygen into the mixer of vapors (4) or that the controller controls a second flow rate of the gas containing the oxygen supplied into said fuel reformer. Woods et al teaches a reforming system (Fig.2) where air (28), fuel (26) and steam (30) are mixed in a mixer (30) before being fed into a reformer (24). Since Woods et al equivalently teaches a means of providing a reformer with oxygen and fuel, it would have been obvious to one of ordinary skill to have modified the apparatus of Massaki et al to employ a mixer where oxygen is mixed with fuel and directly providing the feed into the reformer with using a combustion unit. Having substituted the structure of Woods et al would have involved only routine engineering design choice.

Masaki does not teach a detector of the first flow rate of the vapors; a detector of the second flow rate of the gas. However, Woods et al teaches that flow rates of fuel, oxygen gas can be varied in proportion to the capacity output of a reforming system (pp.3, col,1, [0037]). Since it is well understood that flow rates are measured by flow detectors, it would have been obvious to have provided the Massaki et al apparatus with flow detectors so as to facilitate optimal flow rates for optimal reformer performance.

Massaki et al teaches a temperature detector [0017] of at least one of the vapors of the gas fuel or the liquid fuel supplied into said fuel reformer. Since a controller (Massaki et al, 36) is provided, a ratio of the first flow rate of the vapors to the second flow rate of the gas is capable of being corrected depending on the output of said temperature detector, and the gas containing the oxygen is capable of being supplied depending on the corrected ratio.

With respect claim 2, the controller (36) provided by Massaki et al is capable of controlling the fuel and oxygen flow rates as claimed.

With respect claim 5, Massaki et al teaches that oxygen can be supplied by a pump utilizing air [0043], thus it would have been obvious to one of ordinary skill to have modified the oxygen feed line taught in accordance with the teachings of Woods et al to use a pump for obtaining oxygen from air.

With respect claim 6, it is well established that atmospheric air can be exploited for use in a reformer whereby a compressor is used to store this air. Accordingly, it would have been a matter of routine engineering design choice to have used a compressor adapted to obtain atmospheric air for the source of the gas containing oxygen.

With respect claim 8, since temperature detectors as claimed are present in the within the disclosure of Massaki et al [0017], the temperature detectors are capable of detecting the temperature of the vapors of the gas fuel or the liquid fuel, and wherein the output of the temperature detector is capable of indicating the temperature of the vapors of the gas fuel or the liquid fuel.

With respect claim 9, since temperature detectors as claimed are present in the within the disclosure of Massaki et al [0017], the temperature detectors are capable of detecting the temperature of the gas containing the oxygen, and wherein the output of the temperature detector is capable of indicating of the temperature of the gas containing oxygen.

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With respect claim 10, wherein the mixer (as disclosed by Woods) supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor.

With respect claim 11, wherein the mixer (as disclosed by Woods) supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor, the mixture of gas and vapor supplied to the reforming reactor being non-combusted and non-converted.

Allowable Subject Matter

4. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Ep '219 teaches per claim 3 a fuel reforming method of a fuel reforming system, said fuel reforming system having a fuel reformer (2) for generating a reformed gas containing hydrogen by using a gas containing vapors of a gas fuel or a liquid fuel and a gas containing oxygen, a mixer of vapors (vaporizing device (7) and burning device (6) together correspond to the claimed mixer) of the gas fuel or the liquid fuel and the gas containing the oxygen, a first supplier (11) of vapors of the gas fuel or the liquid fuel into said fuel reformer through the mixer, and second supplier (10) of the gas containing the oxygen into said fuel reformer through the mixer. Examiner notes that the system of the prior art inherently carries out the following operations: supplying the liquid fuel into the first supplier; detecting a temperature of the vapor of the gas fuel or the liquid fuel

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supplied into said fuel reformer [0052]; (Examiner notes that temp detector 32 inherently detects temp of fuel entering fuel reformer).

However, the prior art is silent with respects to using the temperature of the fuel to calculate a first correction coefficient (as defined in Applicant's Specification by way of eqn (2) on pp.12) of a ratio of a first flow rate of the vapors of the gas fuel to a second flow rate of the gas containing the oxygen according to the detected temperature; detecting the first flow rate of the vapors; determining the second flow rate to be supplied to the second supplier according to the detected first flow rate and the determined first correction coefficient; and adjusting the flow rate of the gas containing the oxygen into said fuel reformer by controlling the second supplier according to the determined second flow rate.


At best, section [0092] of the prior art discloses that a detected temperature is used to calculate a ratio between fuel flow rate (corresponding to claimed vapor flow rate) and air flow rate (corresponding to claimed gas flow rate). Claims 4,7,12,13 depend on claim 3.

With respect to claim 11, EP "219 does not teach that the (6 and 7) corresponding to a mixer supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor, the mixture of gas and vapor supplied to the reforming portion being non-combusted and non-converted since (6) and (7) involve combusting fuel vapor and oxygen gas prior to supplying to a reforming portion (4).

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Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Supervisory Patent Examiner
Technology Center 1702